ICT in Medical Education in Trinidad and Tobago

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INTRODUCTION AND BACKGROUND

Information and communication technology (ICT) allows users to access information without taking geographic position into account. These users are also unconstrained by time, volume, or format of the information. ICT applications have enormous potential as a tool for aiding development in countries such as Trinidad and Tobago. Telemedicine, which can provide medical services to persons in isolated places, in emergencies, to the homebound, or the physically challenged, is but one example. Mansell and Wehn de Montalvo (1998) noted that "ICT applications facilitate telemedicine" (p. 85), and that "economic development can be fostered by teleworking and tele-services in some developing countries" (p. 83).

The twin-island nation of Trinidad and Tobago lies at the southern end of the Caribbean chain of islands, approximately seven miles off the northeast coast of Venezuela. The area covers 1,864 square miles (5,128 sq. km.), with a population of approximately 1.5 million. The economy of this small nation state is based mainly on petroleum and gas-based industries, but there is a growing service sector. PAHO figures (2002a, b) show a highly literate population with an overall adult literacy rate of 98.5% (males at 99.1% and females at 97.9%).

Transshipment and telecommunications facilities contribute to this country's position as the most industrialized in the Caribbean. The country's technical capacity and access to information have grown enormously in recent years. Telecommunication tools extend to the vast majority of the population. Per capita GDP stands at US$8,500.

There is a shortage of medical staff in general, with the ratio of doctors to inhabitants at 7.5 per 10,000. Shortages in primary health care are more acute than in other areas and have resulted in the employment of retired nurses and the recruitment of professional staff from other countries, particularly from Nigeria, India, and more recently, from Cuba. Trinidad and Tobago therefore stands poised to benefit from further development by fully embracing ICT, especially in the areas of education and medicine.

MEDICAL EDUCATION IN TRINIDAD AND TOBAGO

Medical education in Trinidad and Tobago engenders self-directed, lifelong learning through the use of the problem-based learning (PBL) method of teaching. The Faculty of Medical Sciences (FMS) of the University of the West Indies opened in St. Augustine, Trinidad and Tobago, in 1989, and has utilized PBL from its inception. Students' relative independence has been noted (Donner & Bickley, 1993) in students following PBL programs. Donner and Bickley noted that "they differ markedly from those following traditional medical programmes… [becoming] more skilled at an eclectic style of learning" (p. 297). These students show particular personal characteristics that encourage them to take a proactive role in their own learning, making them lifelong learners.

Research has also shown that PBL students make maximum use of library resources and that librarians taught the use of technology as a means of accessing, organizing, and managing information (Marshall, 1993). Library instruction is therefore a required part of the curriculum. Librarians become not just providers of books and other materials but also instructors in the use of modern technology. The library, therefore, prepares medical students for wider use of other applications and technologies to support their future information needs. This has implications for how these students will operate when faced with adverse conditions such as rural health offices and hospitals with limited resources, and for development in the community generally; these students in their homes, in their practices, and in the wider community will generate a multiplier effect.

INSTRUCTIONS IN THE USE OF MODERN TECHNOLOGIES IN THE MSL

From its inception, the Medical Sciences Library (MSL) has embarked on a program of information literacy for

undergraduates and other categories of users. From as early as 1993, topics such as "MEDLINE: basic and advanced"; "International Pharmaceutical Abstracts (IPA)"; "MedCarib—health literature for the Caribbean"; "ProCite"; "Introduction to Computers"; and later, "EPI Info"; "Introduction to the Internet" and "PubMed" have been taught. In facilitating this training, the library equips its clientele with survival skills for the 21st century.

The Trinidad and Tobago Ministry of Health also recognized a need for retraining, because new demands were being placed on practitioners by health care transition, health care reforms, increased public and patient expectations, and advances in medical sciences and technology. The Ministry found that medical practitioners required additional skills. This was part of the rationale for the introduction in 2000 of a new postgraduate diploma in Primary Care and Family Medicine being offered by dual mode, face-to face initially, and thereafter, through distance education.

The library component of this course focused on skills such as "Locating and evaluating health information"; "Skills base for managing health information resources"; "Innovations in health information practice"; "Effective search and retrieval principles"; "MEDLINE on the Internet"; "Finding biomedical information on the Internet"; "Evaluating information resources"; and "Managing bibliographic references". Assessment tasks included:

- Joining and leaving an electronic discussion group
- Subscribing and unsubscribing to a mailing list
- Posting to a discussion group
- Locating an electronic serial and printing an article or abstract
- Executing a search on MEDLINE or PubMed and printing the results
- Creating a small database and generating a bibliography

Each session represented distinct skills requirements and supported the utilization of applications to manage the efficient exchange of information among health professionals.

ICT IN EDUCATION: PRIMARY, SECONDARY, AND TERTIARY

Primary and secondary schools in Trinidad and Tobago are also embracing the technology. Many secondary schools have computer science as a subject on the curriculum and typically have computer laboratories. More than 35% of the 78 primary and 120 secondary schools listed in the telephone directory for 2003–2004 have computers with Internet access facilitated by Telecommunication Services of Trinidad and Tobago (TSTT), the only telephone company on the twin islands. Additionally, there are 22 Internet cafes listed in the yellow pages of this directory. Some of these Internet cafes are located in rural areas such as Enterprise, in Central Trinidad, and Penal in the south of the island. Eighteen Internet Service Providers are listed as well.

Other initiatives to produce a computer literate society in Trinidad and Tobago include the government making computer loans available to all public servants. In 2002, the government also launched an initiative, the National Information and Communications Technology Plan (2004), that aims "to connect people, communities, business, government and educational institutions through an integrated technology network. It will also examine the policy, financial and skills development requirements that will be necessary to ensure sustainability and to ensure that the benefits of connectivity continue to grow, and accelerate, as new technologies, innovation and thinking emerge."

A survey (NIHERST, 2002) designed to provide empirical data on the penetration of ICT in private households reflects the varying penetration of ICT in private homes of varying socioeconomic status. Data were collected from a representative sample of 2,812 households throughout Trinidad and Tobago. Thirteen percent (13%) of the households in Trinidad and Tobago (approximately 44,600 households based on national statistics for 2000) had a home computer as of June 2001. By comparison, more than 30% of the households in a number of Organisation for Economic Co-operation and Development (OECD) countries were equipped with computers in 1997, and more than half (54%) of the households in Australia had computers in May 2000. Other important findings of the survey were that affordability was the major constraint in 56% of all households without computers; ranging from 43.9% in the City of Port of Spain to 78% in the Borough of Point Fortin. Also, 53% of households purchased computers from private savings; 13% accessed government loans. Households (20%) with gross monthly incomes of $6,000–$7,999 had the largest proportion of home computers, followed by 15% of households with incomes of $4,000–$5,999. Only 5% of households with monthly incomes of less than $2,000 had computers. In 2000, 27% of the computers were acquired compared with 6.7% in 1997. Almost three out of four persons (73%) in each household used the computer. The proportion of male (51%) to female (49%) computer users was generally similar. Approximately 16.6% of computer users were between 15 and 19 years of age, 16.3% between 30 and 39 years and 14.5% between 40 and 49 years. Of computer